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PCT

RAW SEQUENCE LISTING   DATE: 03/14/2002
PATENT APPLICATION: US/09/890,782 TIME: 14:40:34

Input Set : **N:\Crf3\Refhold\I890782.raw**
Output Set: **N:\CRF3\03142002\I890782.raw**

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    1 <110> APPLICANT: Rijksuniversiteit Leiden
    2 <120> TITLE OF INVENTION: method of modulating metabolite biosynthesis in
    3       recombinant cells
    4 <130> FILE REFERENCE: BO 43339
    5 <140> CURRENT APPLICATION NUMBER: US/09/890,782
C-->6 <141> CURRENT FILING DATE: 2002-03-14
    7 <160> NUMBER OF SEQ ID NOS: 21
    8 <170> SOFTWARE: PatentIn Ver. 2.1
   10 <210> SEQ ID NO: 1
   11 <211> LENGTH: 1754
   12 <212> TYPE: DNA
   13 <213> ORGANISM: Catharanthus roseus
   14 <400> SEQUENCE: 1
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   16       ggaattacta aaatcggaag aagaaatcaa cgcgacgaaa gagaaaaaga acaaaagggt 120
   17       ttcgtttttg taaagtttga ttcttggcgg agattttcga caaggagtg ggcaatttgt 180
   18       gcaatacttc tgagaaaatt gaaagagata caaggatggc tcttcttgat caggcatcca 240
   19       atttgagtcc catgcctttt gatttcacta gaaagaggaa gtcgaggagg agggatggta 300
   20       ctaagaacgt agcggagaca cttgcaaagt ggaaagagta taatgagaaa cttgatgctt 360
   21       tagatggagg gaaaccagct cggaaggttc ctgccaaagg atcaaaaaag ggatgtatga 420
   22       aaggtaaagg aggccctgag aattctcact gcaaatacag aggagttagg cagaggacat 480
   23       ggggtaaatg ggtggccgaa attcgggaac caaacagggg tagcaggctt tggttgggta 540
   24       cattcagaaa cgcgatagaa gctgcacttg cttatgatga agcagcgagg gcgatgtatg 600
   25       ggccttgtgc taggcttaat cttccgaact ataggcttc agaagaatct tcttccttgc 660
   26       caacaacatc aggatcagat acgactactg cttctggcat ctcagaggtc tctgtctatg 720
   27       aagacaaaaa gttcacacca gttgtttccg gattgaaaca agatgacaag ggtgaatcat 780
   28       tagagtcagc tgatagtaaa cctcaactcc tggtcgatgc tggcactccc atgagtgcag 840
   29       tgaaggaaga accaaaagaa tatcaggtta tggattccca gtctgaaggg caattcggag 900
   30       acgaggaacc gcctagcaag cttgtttgta agaagtcga ctttgggcag gatcaagctg 960
   31       ttgttcctgc tgttaaaaat gctgaggaga tgggtggaga gatgggtgga gatatactga 1020
   32       aaggctgttc tttgtctgag atgtttgatg tggacgagtt gttgagcgtt ttagattcta 1080
   33       cacccctcca tgcctcagat tttcagcatg gcatgggaaa tggtaatgta aaggcagagg 1140
   34       ctgcttacaa ctatgctcct tcatgggact cggccttcca gttgcagaat caagatccta 1200
   35       agctaggaag tcagcagcac atggcgcaga caccccccaga aattaattcc gggcttgatt 1260
   36       ttttgcagcc aggaagacaa gaggactcct attttacttt gggtgatcta gactttcttg 1320
   37       atttgggtgc tgaattggga ttgtaaatcc gaagttgttg aagctaaaag cggcgactat 1380
   38       gaaactggaa ttttggaacg gcttattgtt cctggtgttt gtcttagttc tagtctgttt 1440
   39       atgtactaga acttgacata taggaggctt ttgaaagctg aacaaacgaa gtgtgaatta 1500
   40       ttttcttttt ttgtttttct gcagcgatgt atactaacat ctctactact aaaattacgt 1560
   41       ctcttcgtct tcactaacag tagggtggag ctgattctct tttaagtttt tcagaagggg 1620
   42       aattcagcta tgagtttaga ggcagggtag tgtagttcag tgagcagatt ctttctgtag 1680
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   44       tggaggttgt atct                                                   1754
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Input Set : N:\Crf3\Refhold\I890782.raw
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47 <211> LENGTH: 885
48 <212> TYPE: DNA
49 <213> ORGANISM: Catharanthus roseus
50 <400> SEQUENCE: 2
51      caacaataat gtatcaatca aatgcccata attccgatca tctaaccttc ttaccacctt 60
52      tagtagatta tcaattcctc aacaacgatt ttgatttttc agaaatattt acagatttca 120
53      attacgctaa ttataattat aatacttcta cctcagataa tttctctggt tttcaattca 180
54      atgaaaattg cgaagaaatt atttcaccaa attatgcttc ggaagattta tcggatatta 240
55      ttttaacaga tatttttcaag gatcaggata attacgaaga cgaagtcgtt gcgggagaac 300
56      aagaagaaga attaattacg acacctacct ctcgcggcgg cggcggcggc ggatgtgagc 360
57      agagatcgaa tgaggaatgg attaggtacc gtggcgttag acggcggcca tgggggaaat 420
58      tcgctgcgga aatcagggat cccaagagaa aaggatcgag gatatggttg ggaacttacg 480
59      agacggcgga agatgcggca ttagctttcg atcaagcggc gtttcaactc cgtggttcta 540
60      gagctaggtt aaattttccc aatcttattg gttctgctaa tgctccggtt agagtaagtc 600
61      ctagacgccg atcttcatcg tgtcatcttc gtcctcaata atcctatcca cagttccatg 660
62      gggatagtaa attttttctt tgagtttttt agaagttata ttatctattg aaaaaataca 720
63      aaacattgca aatatttttt tagtacgtct ctatacttct ttttagtaat attcggatca 780
64      tgagcatggg gaaggtgata ttatccattg tcataaatta atagatacag tatcataaat 840
65      taatatgtac gaattacaag taaaatatag taagtgttaa tattg 885
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68 <211> LENGTH: 792
69 <212> TYPE: DNA
70 <213> ORGANISM: Catharanthus roseus
71 <400> SEQUENCE: 3
72      ttctaaaaaa gaagaaaaat gtccgaagaa atcatttccg tctcagatcg atttcttctt 60
73      tccttaatcg aagaacatct tctcagcgat aattctgatg attccagctc ggaattgact 120
74      tctacagagg aaaattggga agaaattttt gcagattttc taaattggtc gggatccgaa 180
75      atacagaaac gcggtagccc gagttccgaa agctgtcaat cgaattcaat ggcggaaagc 240
76      tgtcaggagg attctgttgt gggaaccccg ccagaagcgg cggccggagg aggttgttcg 300
77      aaggattgga accggtataa gggcgttaga cggcggccgt gggggaagtt cgcggcggag 360
78      ataagggatc cgaaaaagaa aggatccagg atttggttgg gtacatacga gacacctgag 420
79      gatgcagcat tggcttatga tgcagccgcg tttaatatgc gtggagctaa agctaggctt 480
80      aatttttcctc atttgattgg ttcgaatatt tccggacccg ttagagtaaa cccgagaaaa 540
81      cgtttccctg cggagccttc tacgacgtcg tcgtcttctt cttcttcttc gtctgaaaat 600
82      agtggaggaa ggaagaagag acgatattaa ttaattatta aaagtggagg attaaaaaaa 660
83      ttctgtgaaa tgagagatta ttacgtggtt tttgttaagc ccgataatcc ctcattgtaa 720
84      aattattaac ttcatcgatg ttcttttta aatctttgga atgtacaaaa ttttatatcc 780
85      aaaaaagttc ac 792
87 <210> SEQ ID NO: 4
88 <211> LENGTH: 376
89 <212> TYPE: PRT
90 <213> ORGANISM: Catharanthus roseus
91 <400> SEQUENCE: 4
92      Met Ala Leu Leu Asp Gln Ala Ser Asn Leu Ser Pro Met Pro Phe Asp
93       1               5                  10                  15
94      Phe Thr Arg Lys Arg Lys Ser Arg Arg Arg Asp Gly Thr Lys Asn Val
95                  20                  25                  30
96      Ala Glu Thr Leu Ala Lys Trp Lys Glu Tyr Asn Glu Lys Leu Asp Ala
```

```
97                  35                40                45
98      Leu Asp Gly Gly Lys Pro Ala Arg Lys Val Pro Ala Lys Gly Ser Lys
99           50                55                60
100     Lys Gly Cys Met Lys Gly Lys Gly Gly Pro Glu Asn Ser His Cys Lys
101        65                70                75                80
102     Tyr Arg Gly Val Arg Gln Arg Thr Trp Gly Lys Trp Val Ala Glu Ile
103                  85                90                95
104     Arg Glu Pro Asn Arg Gly Ser Arg Leu Trp Leu Gly Thr Phe Arg Asn
105                  100               105               110
106     Ala Ile Glu Ala Ala Leu Ala Tyr Asp Glu Ala Ala Arg Ala Met Tyr
107             115               120               125
108     Gly Pro Cys Ala Arg Leu Asn Leu Pro Asn Tyr Arg Ala Ser Glu Glu
109             130               135               140
110     Ser Ser Ser Leu Pro Thr Thr Ser Gly Ser Asp Thr Thr Thr Ala Ser
111     145               150               155               160
112     Gly Ile Ser Glu Val Ser Val Tyr Glu Asp Lys Lys Phe Thr Pro Val
113                  165               170               175
114     Val Ser Gly Leu Lys Gln Asp Asp Lys Gly Glu Ser Leu Glu Ser Ala
115             180               185               190
116     Asp Ser Lys Pro Gln Leu Leu Val Asp Ala Gly Thr Pro Met Ser Ala
117             195               200               205
118     Val Lys Glu Glu Pro Lys Glu Tyr Gln Val Met Asp Ser Gln Ser Glu
119             210               215               220
120     Gly Gln Phe Gly Asp Glu Glu Pro Pro Ser Lys Leu Val Cys Lys Glu
121     225               230               235               240
122     Val Asp Phe Gly Gln Asp Gln Ala Val Val Pro Ala Val Lys Asn Ala
123             245               250               255
124     Glu Glu Met Gly Gly Glu Met Gly Gly Asp Ile Leu Lys Gly Cys Ser
125             260               265               270
126     Leu Ser Glu Met Phe Asp Val Asp Glu Leu Leu Ser Val Leu Asp Ser
127             275               280               285
128     Thr Pro Leu His Ala Ser Asp Phe Gln His Gly Met Gly Asn Gly Asn
129             290               295               300
130     Val Lys Ala Glu Ala Ala Tyr Asn Tyr Ala Pro Ser Trp Asp Ser Ala
131     305               310               315               320
132     Phe Gln Leu Gln Asn Gln Asp Pro Lys Leu Gly Ser Gln Gln His Met
133             325               330               335
134     Ala Gln Thr Pro Pro Glu Ile Asn Ser Gly Leu Asp Phe Leu Gln Pro
135             340               345               350
136     Gly Arg Gln Glu Asp Ser Tyr Phe Thr Leu Gly Asp Leu Asp Phe Leu
137             355               360               365
138     Asp Leu Gly Ala Glu Leu Gly Leu
139             370               375
141 <210> SEQ ID NO: 5
142 <211> LENGTH: 210
143 <212> TYPE: PRT
144 <213> ORGANISM: Catharanthus roseus
145 <400> SEQUENCE: 5
146     Met Tyr Gln Ser Asn Ala His Asn Ser Asp His Leu Thr Phe Leu Pro
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147          1              5                10               15
148       Pro Leu Val Asp Tyr Gln Phe Leu Asn Asn Asp Phe Asp Phe Ser Glu
149                    20              25              30
150       Ile Phe Thr Asp Phe Asn Tyr Ala Asn Tyr Asn Tyr Asn Thr Ser Thr
151                35              40              45
152       Ser Asp Asn Phe Ser Gly Phe Gln Phe Asn Glu Asn Cys Glu Glu Ile
153            50              55              60
154       Ile Ser Pro Asn Tyr Ala Ser Glu Asp Leu Ser Asp Ile Ile Leu Thr
155        65              70              75              80
156       Asp Ile Phe Lys Asp Gln Asp Asn Tyr Glu Asp Glu Val Val Ala Gly
157                    85              90              95
158       Glu Gln Glu Glu Glu Leu Ile Thr Thr Pro Thr Ser Arg Gly Gly Gly
159                100             105             110
160       Gly Gly Gly Cys Glu Gln Arg Ser Asn Glu Glu Trp Ile Arg Tyr Arg
161                115             120             125
162       Gly Val Arg Arg Arg Pro Trp Gly Lys Phe Ala Ala Glu Ile Arg Asp
163            130             135             140
164       Pro Lys Arg Lys Gly Ser Arg Ile Trp Leu Gly Thr Tyr Glu Thr Ala
165        145             150             155             160
166       Glu Asp Ala Ala Leu Ala Phe Asp Gln Ala Ala Phe Gln Leu Arg Gly
167                    165             170             175
168       Ser Arg Ala Arg Leu Asn Phe Pro Asn Leu Ile Gly Ser Ala Asn Ala
169                180             185             190
170       Pro Val Arg Val Ser Pro Arg Arg Arg Ser Ser Ser Cys His Leu Arg
171                195             200             205
172       Pro Gln
173                210
175 <210> SEQ ID NO: 6
176 <211> LENGTH: 203
177 <212> TYPE: PRT
178 <213> ORGANISM: Catharanthus roseus
179 <400> SEQUENCE: 6
180       Met Ser Glu Glu Ile Ile Ser Val Ser Asp Arg Phe Leu Leu Ser Leu
181        1               5                10              15
182       Ile Glu Glu His Leu Leu Ser Asp Asn Ser Asp Asp Ser Ser Ser Glu
183                    20              25              30
184       Leu Thr Ser Thr Glu Glu Asn Trp Glu Glu Ile Phe Ala Asp Phe Leu
185                35              40              45
186       Asn Trp Ser Gly Ser Glu Ile Gln Lys Arg Gly Ser Pro Ser Ser Glu
187                50              55              60
188       Ser Cys Gln Ser Asn Ser Met Ala Glu Ser Cys Gln Glu Asp Ser Val
189        65              70              75              80
190       Val Gly Thr Pro Pro Glu Ala Ala Ala Gly Gly Gly Cys Ser Lys Asp
191                    85              90              95
192       Trp Asn Arg Tyr Lys Gly Val Arg Arg Arg Pro Trp Gly Lys Phe Ala
193                100             105             110
194       Ala Glu Ile Arg Asp Pro Lys Lys Lys Gly Ser Arg Ile Trp Leu Gly
195                115             120             125
196       Thr Tyr Glu Thr Pro Glu Asp Ala Ala Leu Ala Tyr Asp Ala Ala Ala
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```
197          130                  135                  140
198    Phe Asn Met Arg Gly Ala Lys Ala Arg Leu Asn Phe Pro His Leu Ile
199    145                  150                  155                  160
200    Gly Ser Asn Ile Ser Gly Pro Val Arg Val Asn Pro Arg Lys Arg Phe
201                        165                  170                  175
202    Pro Ala Glu Pro Ser Thr Thr Ser Ser Ser Ser Ser Ser Ser Ser Ser
203                   180                  185                  190
204    Glu Asn Ser Gly Gly Arg Lys Lys Arg Arg Tyr
205              195                  200
207 <210> SEQ ID NO: 7
208 <211> LENGTH: 48
209 <212> TYPE: DNA
210 <213> ORGANISM: Catharanthus roseus
211 <400> SEQUENCE: 7
212    gtacatcact cttagaccgc cttctttgaa agtgatttcc cttggacc                48
214 <210> SEQ ID NO: 8
215 <211> LENGTH: 25
216 <212> TYPE: DNA
217 <213> ORGANISM: Artificial Sequence
218 <220> FEATURE:
219 <223> OTHER INFORMATION: Description of Artificial Sequence: primer
220 <400> SEQUENCE: 8
221    ccacgtggtt gtagtctctt agacc                                       25
223 <210> SEQ ID NO: 9
224 <211> LENGTH: 25
225 <212> TYPE: DNA
226 <213> ORGANISM: Artificial Sequence
227 <220> FEATURE:
228 <223> OTHER INFORMATION: Description of Artificial Sequence: primer
229 <400> SEQUENCE: 9
230    ggtacatcag agaatgaccg ccttc                                       25
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233 <211> LENGTH: 26
234 <212> TYPE: DNA
235 <213> ORGANISM: Artificial Sequence
236 <220> FEATURE:
237 <223> OTHER INFORMATION: Description of Artificial Sequence: primer
238 <400> SEQUENCE: 10
239    cactcttact ggcgcttctt tgaaag                                      26
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242 <211> LENGTH: 21
243 <212> TYPE: DNA
244 <213> ORGANISM: Artificial Sequence
245 <220> FEATURE:
246 <223> OTHER INFORMATION: Description of Artificial Sequence: primer
247 <400> SEQUENCE: 11
248    agaccgcgaa gaatgaaagt g                                           21
250 <210> SEQ ID NO: 12
251 <211> LENGTH: 29
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VERIFICATION SUMMARY   DATE: 03/14/2002
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L:6 M:271 C: Current Filing Date differs, Replaced Current Filing Date